



DATA & APPLICATIONS ONLINE

Satellite-Derived Environmental Indicators

Overview

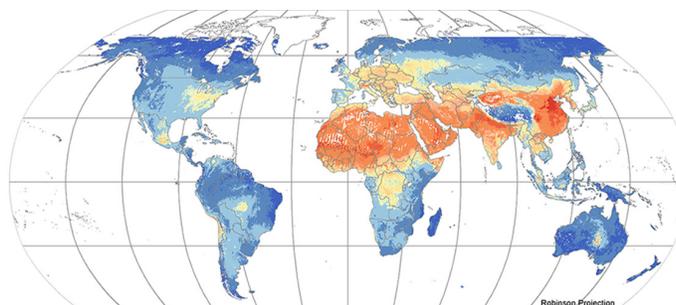
Environmental indicators simplify complex information about the state of the environment and human-environment relationships, identifying problem areas and revealing underlying trends. Satellite data have many worthwhile characteristics, including broad spatial coverage and consistent measurement over time. The development of a scientifically robust set of satellite-derived environmental indicators may inform policymaking that protects the environment and human health.

Exposure to fine particles is associated with premature death as well as increased morbidity from respiratory and cardiovascular disease, especially in the elderly, young children, and those already suffering from these illnesses. The World Health Organization guideline for average annual exposure to fine particulate matter of 2.5 micrometers or smaller ($PM_{2.5}$) is less than or equal to 10.0 micrograms per cubic meter, whereas the US Environmental Protection Agency (EPA) primary standard, designed to protect public health with an adequate margin of safety, is less than or equal to 12.0 micrograms per cubic meter.

For this data set, estimates of annual $PM_{2.5}$ concentrations over a 10-year period (2001–2010) were generated using a model developed by Dalhousie University researchers. The grids were derived from NASA MODIS, MISR, and SeaWiFS satellite data.

About the Data

Together the grids provide a continuous surface of concentrations in micrograms per cubic meter of particulate matter of 2.5 micrometers or smaller ($PM_{2.5}$) for health and environmental research. The raster grids have a grid cell resolution of 6 arc-minutes (0.1 degree, or approximately 10 km at the



equator) and cover the world from 70°N to 55°S latitude.

Data Access

Go to bit.ly/1TgCaga to download data, maps, and information.

References

van Donkelaar, A., Martin, R. V., Brauer, M., and Boys, B. L. 2015. Use of satellite observations for long-term exposure assessment of global concentrations of fine particulate matter. *Environmental Health Perspectives* 123:135-143. <http://dx.doi.org/10.1289/ehp.1408646>.

Aina, Y., van der Merwe, J., and Alshuwaikhat, H. 2014. Spatial and temporal variations of satellite-derived multi-year particulate data of Saudi Arabia: An exploratory analysis. *International Journal of Environmental Research and Public Health* 11(11): 52–11166. <http://dx.doi.org/10.3390/ijerph11111152>.

Feldman, L., Gao, C., Zhu, J., Simatovic, J., and To, T. 2014. Impact of air pollution on physician office visits for common childhood conditions in Ontario, Canada. *Allergy, Asthma & Clinical Immunology* 10(Suppl 2): A54. <http://dx.doi.org/10.1186/1710-1492-10-S2-A54>.



Socioeconomic Data and Applications Center (SEDAC)
CIESIN, Earth Institute at Columbia
University Palisades, New York
<http://sedac.ciesin.columbia.edu>

www.nasa.gov



EOSDIS DAACs
SEDAC is one of twelve NASA Earth Observing System Data and Information System (EOSDIS) Distributed Active Archive Centers (DAACs)

To learn more about data and tools available from EOSDIS, go to earthdata.nasa.gov.